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ABSTRACT

Thirty children, 7.5 to 8.5 years, in two classrooms in a Catholic school trying to implement an informal curriculum were studied. The classrooms were not "exemplary"; The children had lower-middle-class origins. Each child was observed under free-choice conditions for approximately 80-90 minutes over a 3-month period. Two-minute narrative records were collected and later coded with regard to activity categories, social interactions, distractions. A battery of tests including subscales from the WISC, Matching Familiar Figures Test of cognitive style and items from Wallach and Kogan's associational fluency tasks were also given to each child. The various observational and test scores were correlated. WISC Vocabulary scores and MFF scores produced the major significant correlates with activities. For instance, a pattern emerges in which children with higher vocabulary scores and reflective cognitive styles pursue more traditional academic tasks, particularly reading activities and also spend more of their time focused on activities without companions. The pattern of correlations regarding IQ is strikingly similar to that often found in traditional highly structured classrooms. Possible sources of these similarities, including the ecologies of the particular classes studied are explored. (Author/MS)

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CORRELATES OF CHILDREN'S PATTERNS OF ACTIVITY IN "GARDEN VARIETY" OPEN CLASSROOMS*

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One of the major purposes of open or informal education is to allow children to pursue their interests through self-selection of activities. The preliminary study[1] I will report today had two major purposes: the first was to collect data which described some of the important aspects of children's actual behavior in open classrooms. The second was to explore possible relationships among certain intellectual, personal, and stylistic variables which can be assessed in children, and their classroom behavior patterns.

Recently, a small number of studies have appeared which contain systematic observational data on children's behaviors in open and other types of classrooms (Stallings, 1975; Ross, Zimiles, & Gerstein, 1976; Grannis, 1973; and Gump, 1967). From an evaluation perspective, some authors (e.g., Shapiro, 1973; Zimiles, 1973; Patton, 1975 and Stodolsky, 1975) believe that such descriptions of classroom process behaviors are significant contributions to assessments of the quality of programs. However, most research on open education has been executed in the traditional summative mold of assessing the outcomes of such schooling experiences, primarily using standardized achievement test results and the like. Horwitz (1972) provides a comprehensive review of such outcome studies.

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Some systematic work on preschool children (Stodolsky, 1974; Karlson, 1972) has shown that children do have unique patterns of activity under free-choice conditions. It seemed reasonable to expect that older children in open elementary classrooms would also demonstrate individual differences in their classroom activity patterns. While the relations between such characteristics as intelligence, anxiety, etc., and school achievement have been studied in traditional classrooms (Bloom, 1964; Wallach and Kogan, 1965; Potter, 1974) in open classrooms, the relations, if any, between measurable individual differences in children and classroom behaviors have not been explored.

The selection of a school setting for the study was an important step. For both practical and methodological reasons, we chose a Catholic school which served working-to-middle-class children and was located on the Northside of Chicago.[2] The school was in its first full-year of operation as an "open" school. While there was a clear commitment to moving toward more child-centered learning, different classrooms were at different stages of implementation. Data and observation indicated that the classrooms in which we worked were not "exemplary" with respect to open education, but were probably fairly typical of many school system attempts to move in informal directions.

We selected two mixed second and third grade classrooms from which to sample children. Resources in the classrooms were limited; there were few manipulatives and concrete materials and

the science curriculum was practically non-existent. However, classrooms were organized into learning centers, and in addition to workbooks and textbooks, they contained games and other learning materials, and were humanely run. In both classrooms children spent a significant portion of the day in self-selected activities. Each classroom contained 34 children and one teacher and was housed in a traditional rectangular schoolroom. Particularly in one of the classrooms one often felt very cramped.

We studied 30 white children, ranging in age from 7-5 to 8-5 years. The children were evenly divided by sex. Twelve came from one classroom, eighteen from the other. The children were selected on the basis of age and sex, being the younger children in each of the classrooms, after each teacher had the opportunity to eliminate any child she felt would be inappropriate for study due to foreign language background or emotional difficulties (2 children were excluded on this basis).

Classroom observations and testing were carried out over a four month period from approximately February to June. A battery of tests was administered to each child over a number of weeks by one female research assistant. Every child was tested with a procedure before others were introduced. Observations were carried out by both myself and the research assistant who tested the children.

The primary goal in selecting a battery of measures was to tap a broad array of variables which might relate to the activity choices made by the children. Wherever possible we used

well standardized instruments suitable for children aged 6-11 years. In order to tap some central intellectual abilities we administered some scales from the Wechsler Intelligence Scale for Children (WISC). These were Vocabulary (verbal ability), Digit Span (memory), Block Design, and Coding. Associative fluency (creativity) has been shown to be reasonably independent of intelligence. We selected a subset of items from the Wallach and Kogan (1965) battery which measures associational fluency in both the verbal and spatial modes. We included items from Alternate Uses, Similarities, Instances and Patterns.

In addition to intelligence and associational fluency, we assessed cognitive style using Kogan's Matching Familiar Figures Test as some of our earlier work had shown this to be an important correlate of nursery school children's free play behavior (Welch, 1973, 1975). We also attempted to assess locus of control through an interview procedure, but found we could not successfully differentiate our children. This was a loss because locus of control is probably an important correlate of classroom behavior (e.g., Solomon and Kendall, 1976).

Observations of children were done by using a two-minute running narrative record, followed by another such record within about fifteen minutes of the first. This was accomplished by observing six randomly selected children in rotation and then returning for a second round to the same six children. The narratives were collected following guidelines from earlier research (Stodolsky, 1974; Wright, 1967). One minute intervals were marked on the records. Between eighty and ninety minutes

of observations were collected on each child over the four-month period. Coding of the narratives was carried out a number of months after observations were completed by two persons who had not been involved in the fieldwork.

Results

The test data were examined for sex and classroom differences using a two-way analysis of variance. Table 1 contains means for the test data and demonstrates that there was only one sex and one classroom difference. The children are in the average range on the WISC (mean verbal WISC approximately 95, mean Performance score approximately 103). MFF categories yielded 11 impulsives, 11 reflectives, 4 fast and accurate children, and 4 who were slow and inaccurate. Thus on these test measures and the associational fluency scores there was great variability in performance in the sample.

The test scores were correlated with one another. As can be seen in Table 2, the various subscales of the WISC relate in the expected fashion but are independent of the associational fluency measures. This is consistent with the earlier work of Wallach and Kogan (1965). There is some relation between the cognitive style measure and the WISC indicating that impulsive children have slightly lower WISC Verbal scores.

Let us turn now to the observational data. Our coding system was applied to each two minute narrative record. We first coded for the type of activity in which the child was engaged. Most records contained one activity, two were permissible

if each occupied a minute. We coded for eighteen different activity categories which were identified after a process of listing all the pursuits in which we had observed the children. Most of the activity categories are likely to be found in many elementary classrooms, a few may be unique to the situation in which we worked or were of special interest to us.

Seven of the activities involved what would traditionally be considered academic subjects (Language Arts, Reading, Math, Story Writing, Listening to Stories and Records, Reference Work and Unspecified Schoolwork); five activities reflect other non-academic content.[3] These five were Art, Drawing and Painting, Clay, Games and Puzzles, and Construction Toys and Props. The remaining six activities were social enterprises or transition states (Sociodramatic Play and Role Play, Clubs and Social Organization, Social (active) Play, Social Talk, Fighting, and Transitions).[4]

In addition to coding the actual category of activity in which the child was engaged we coded whether the presumed f cus of the child's activity (e.g., math sheet), was the child's only focus, or whether he was involved in the activity and some seemingly related talk, or involved in the activity accompanied by social or unrelated talk. We also coded Distractions when a child had some presumed activity in front of him but in fact was doing something else for a significant portion of the two minute record. Distractions were considered Continuous when more than one minute was off task; Non-Continuous Distractions took less than half the record. Beside Activity categories,

whether the child's activity was accompanied by social or related talk, and Distractions and Interruptions, we also coded social interactions of various kinds.

Time does not permit a complete detailing of the ways in which the children spent their time. It should be recalled that we tried to observe only when the children genuinely were permitted a choice of activity (in one classroom this was virtually always the case; in the other, children were occasionally pursuing activities they were expected to accomplish during the time we were observing). Since we didn't sample from the entire day we cannot assume that the distribution of activities represents a complete picture of children's pursuits in school; however, it does, we believe, fairly portray their use of free choice times in these environments.

Table 3 contains data showing the distribution of activities, distractions, and interactions, for the total sample, by sex and classroom, as well as the results of a two-way analysis of variance for sex and classroom effects. For the total sample, of all activities (excluding transition), 45% were Academic, 32% were Non-Academic, and 23% were Social. The activities engaged in most frequently were Language Arts (12%), Drawing (12%), Math (11%), Reading (10%) and Social Talk (9%). All others occurred five percent or less of the total.

When we look at whether the Academic or Non-Academic pursuits were accompanied by talk, we find that 45% of these activities were the sole focus for the child, 43% were accompanied by related talk-- including cooperative and helping dialogues,

as well as competitive interchanges, and 12% were activities accompanied by social talk. It is important that we insisted in these instances that the child really was engaged in the activity as well as talking (that is, the child had a dual focus). If this were not the case, the activity was coded in one of the Social Categories such as Social Talk.

Out of the average of 44 activities coded for each child, approximately seven were transitions in which the child was not engaged in an activity which had a focus and a beginning, middle and end; thus about 15% of the time children were in transitions, a slightly lower figure than we have found for preschoolers (Stodolsky, 197^). Also, children experienced about 6 Continuous Distractions or Interruptions when they were off-task for the bulk of the two-minute observation-- this represents another 13% of observations in which the children were not engaged in activities. If we roughly consider transitions and distractions as off-task time, we estimate that the children engaged in some focused activity approximately 72% of the time-- a figure very similar to estimates from traditional classrooms studied by Gump (1967), but lower than figures derived by Grannis (1973) and Ross, Zimiles and Gerstein (1976) in other better established open environments, and Wang (1976) for self-management settings.

Social interactions occurred about once a minute. When they occurred they were overwhelmingly with same-sex peers. On average, 92% were peer interactions, only 8% were with the Teacher. Most interactions had a friendly or neutral tone.

Having described both the test performance and classroom behaviors of the children, we now come to the question of whether these two sources of data are meaningfully related. Are there correlates of children's classroom activity patterns? It should be noted that this was an exploratory study and we did not begin with any predictions about specific relations. Consequently we took the approach of examining the correlations among the test variables and classroom behaviors to see if any consistent and meaningful patterns emerged. This is clearly an ad hoc procedure, but seemed appropriate in view of the preliminary nature of the study. After locating certain meaningful patterns we ran a small number of regression analyses to remove interdependencies in the predictor variables.

Examining the data in this fashion, it became clear that the WISC Vocabulary score is by far the strongest test correlate of the observational variables. Next in potency is the MFF variable. The associational fluency measures show only a few behavioral correlates.

The WISC Vocabulary score has a series of significant positive correlations with the Percent of Total Academic Activities (.599***),[5] the Percent Focus on the Activity Itself (.485**), the Percent of Reading (.451*), Percent of Games (.443*) and the Percent of Activities Alone (583***). Thus children with higher verbal intelligence test scores, pursue more "academically" oriented activities in these free choice classrooms than do children with lower vocabulary scores. Of interest is that these higher vocabulary children spend more time reading, more

time in academic activities generally, focus more on activities without talking with others, and spend more time alone. Interestingly, these same variables show a systematic relation to the MFF cognitive style variable. Thus MFF category shows a significant negative correlation with the Percent of Total Academic Activities (-464**), indicating that more reflective children pursue more academic activities; a similar negative correlation is present for Percent of Focus on the Activity Itself (-484*), with the Percent of Reading (MFF errors -433*, MFF Time +415*), and the Percent of Activities Alone (-480** with MFF category).

Thus a fairly consistent picture emerges in which children with higher vocabularies and more reflective cognitive styles are pursuing more academic, particularly more reading activities. They are spending more time focused on activities without talking to others and more time alone. This does not mean these children are social isolates, our data do not indicate that at all, but it is the case that despite a very heavy social press, these high verbal, reflective children can tune out social temptations and pursue some academic interests more of the time than others do, and they seem motivated to do so.

The correlations presented so far indicate that children with lower vocabulary scores and more impulsive cognitive styles will pursue academic tasks and reading less often and are not alone or focused exclusively on tasks as much as their high verbal, reflective classmates. Additional correlations with the WISC Vocabulary show that children with lower vocabulary scores

tend to have more social interactions (-395*). They spend more time in Arts and Crafts (-501**), and Drawing Activities (-395*), more of their activities are in the Social Talk categories (-370*), and other activities are coupled with social talk (-420*). In addition, children with lower vocabulary scores have a broader range of activity types (-482**), sampling more from the types of activities available in the classroom. In sum, children with lower vocabulary scores are more inclined to spend time with other children both as an activity itself, and as an adjunct to other activities they pursue. Arts and Crafts and Drawing activities which are open to pursuit along with social exchanges seem popular.

Whereas in the case of the positive correlations with the WISC, reflective cognitive style seemed to lead to a similar picture, the negative correlations with the WISC are not as uniformly confirmed by relations with impulsive cognitive style. It is the case that children with more MFF errors have more interactions (425*), pursue a larger range of substantive activities (442*), and do more Language Arts activities (416*); and impulsive children pursue more Drawing activities (392*). Since these relations are primarily with the MFF error score, we hesitate to make too much of them as there is some negative correlation between MFF errors and WISC Vocabulary (-377*).

As noted earlier, the associational fluency measures showed few correlates with the observational data. The one category of behavior which shows a consistent positive correlation with various of the associational fluency scores is the Percent of Total

Academic Activities with Related Talk (# = 465**, Unique = 449*). Children with higher performance on the fluency tasks seem to spend more of their time interacting with others around Academic tasks. The possible interpretation of this finding would await its replication.

Since the major picture which emerged centered around the MFF and WISC Vocabulary a few regression equations were run with these and other variables. In general we find that we obtain multiple correlations ranging from approximately .50 to .66 with various activity categories. Table 4 contains illustrative results.

Since the classes we observed were not excellent open environments, the pattern of correlates of activity must be interpreted in that light. The combination of better verbal ability and reflective cognitive style associated with academic, reading, and solitary pursuits may be especially prominent in such settings. In earlier work it has been found that reflective children can handle tasks while also monitoring other aspects of the environment (Welch, 1973). Since the classes we observed were very busy, crowded, relatively noisy and sometimes outright chaotic, the personal characteristics of verbal ability and lack of distractibility seem to have come into play. The fact that lower ability children pursued more diverse activities, more non-academic activities such as arts and crafts and drawing, and spent more time with peers also seems consistent with an appropriate adaptation to the settings.

In some respects it would seem that the behavior of children in these classrooms is similar to findings for traditional classrooms. The entering abilities and styles of the children play an important role in their utilization of the learning opportunities. We in no way wish to suggest, however, that the children learned or developed less in these classrooms than they might have in traditionally run classes. We believe that many of the activities-- academic, non-academic and social were probably growth producing. We simply have no evidence on the outcomes of this experience. We do know from our interviews with the children that they almost unanimously stated that they liked school better than they had under a traditional regimen.

It would seem that our findings are consistent with the idea that children will pursue activities that are consonant with their interests and abilities under free-choice conditions. Much more research is necessary to extend and deepen our understanding of such relationships.

TABLE 1

Means and Standard Deviations on Test Measures

For Total Sample, by Sex, and by Classroom

	Total Mean	(n=30) SD	Girls Mean	(n=15) SD	Boys Mean	(n=15) SD	Class A Mean	(n=12) SD	Class B Mean	(n=18) SD
WISC Verbal	23.2	5.6	22.0	4.8	24.3	6.3	24.1	5.2	22.6	6.0
WISC Perf.	26.0	3.7	25.6	4.1	26.4	3.4	27.0	3.8	25.3	3.6
WISC Vocab.[c]	11.9	3.8	11.0	3.5	12.9	3.9	11.5	3.3	12.2	4.1
WISC Digit Span[c]	11.2	3.1	11.0	2.9	11.5	3.4	12.6[b]	3.3	10.3	2.7
WISC Block Design[c]	13.8	3.3	13.5	3.2	14.1	3.4	15.0	2.8	13.0	3.4
WISC Coding[c]	12.2	1.7	12.1	1.5	12.3	2.1	12.0	2.1	12.3	1.5
Total Number (Wallach & Kogan)	121.2	45.8	124.6	55.5	117.7	35.1	111.9	30.1	127.3	53.6
Number Unique (Wallach & Kogan)	24.0	17.7	26.1	22.5	21.9	11.5	21.0	11.1	26.0	21.1
MFF Time	18.1	9.8	21.3[b]	11.5	14.9	6.8	20.4	9.4	16.5	10.0
MFF Errors	11.7	5.2	10.6	6.3	12.8	3.7	10.2	3.7	12.7	5.9
MFF Category[a]	2.5	1.3	2.2	1.2	2.8	1.4	2.3	1.3	2.7	1.4

[a] 1 = reflective, 2 = slow & inaccurate, 3 = fast & accurate, 4 = impulsive.

[b] difference significant $p<.02$.

[c] WISC scales are in standard scores with a range 0-20.

TABLE 2

Correlations Among Test Variables (n = 30)

	Perf.	Vocab.	DS	BD	Coding	#	Unique	MFF Time	MFF Errors	MFF Categ.
WISC Verbal	350	859***	782***	298	189	-237	-079	199	-353	-429*
Perf.	-	232	358	883***	482**	-079	295	411*	-419*	-243
Vocab.		-	353	187	144	-075	072	205	-377*	-468**
Digit Span			-	317	170	-343	-232	114	-187	-214
Block Design				-	013	121	230	361	-384*	-246
Coding					-	098	199	202	-175	-059
Total Number						-	937***	241	-130	082
Number Unique							-	427*	-316	-118
MFF Time								-	-716***	-766***
MFF Errors									-	729***

* p<05
** p<01
*** p<001

TABLE 3

Means for Categories of Observational Data on Activities, Distractions, and Interactions, by Sex and by Classroom

	Total (n=30)	Girls (n=15)	Boys (n=15)	Class A (n=12)	Class B (n=18)	Effects
Total # Activities	44.1	43.3	44.9	42.3	45.8	classroom<.05
Total # Observations	43.4	42.7	44.1	43.1	43.6	n.s.
Range of Sub. Act.	8.6	8.8	8.5	8.4	8.9	n.s.
Range of Soc. Act.	3.3	3.3	3.3	3.9	2.7	classroom<.001
Total # Focus Act. Itself	15.5	14.6	16.5	13.3	17.8	classroom<.06
Total # Foc. Act. & Talk	14.4	13.4	15.5	13.0	15.8	n.s.
Total # Act. & Soc. Talk	3.9	4.6	3.3	3.2	4.7	n.s.
% Focus on Act. Itself	45	44	47	44	46	n.s.
% Focus on Act. & Talk	43	42	45	46	41	n.s.
% Focus on Act. & Soc. Talk	12	15	9	11	13	sex<.05
# Transition Seg.	6.8	6.8	6.7	6.9	6.7	n.s.
% Lang. Arts Total	12	12	12	8	15	classroom<.09
% Math Total	11	14	8	9	13	sex<.005; class<.05
% Art Total (not drawing)	5	7	3	6	4	sex<.01
% Drawing Total	12	10	13	13	10	int.<.02
% Clay Total	3	2	4	-	6	class<.001
% Construction-Props Total	4	2	6	3	5	sex<.02; int.<.04
% Games Total	9	6	12	7	10	sex<.03
% Reading Total	10	9	11	10	10	n.s.
% Story Writing Total	3	4	3	4	3	n.s.
% Story-Record List. Total	3	5	1	4	2	sex<.001; class<.01; int.<.05
% Reference Total	3	2	3	4	2	n.s.
% Unspec. Schl. Work Total	3	3	2	2	4	n.s.

TABLE 3 cont.

	Total (n=30)	Girls (n=15)	Boys (n=15)	Class A (n=12)	Class B (n=18)	Effects
% Total Academic Only [a]	26	27	25	23	30	n.s.
% Total Academic & Talk [b]	17	19	14	17	17	n.s.
% Total Academic & Soc. Talk [c]	2	3	1	2	2	sex<.05
% Academic Total (a+b+c)	45	49	40	41	48	sex<.07
% Non-Acad. Only [d]	9	7	11	9	10	sex<.06
% Non-Acad. & Talk [e]	16	12	21	15	18	sex<.008
% Non-Acad. & Soc. Talk [f]	7	7	6	6	8	n.s.
% Non-Acad. Total (d+e+f)	32	26	38	29	35	sex<.02
% Socio-dram. roles	3	3	2	2	3	int.<.02
% Social Org.-Clubs	5	6	3	9	-	class<.001
% Social Play	5	4	7	7	4	sex<.05; class<.05
% Social Talk	9	9	9	9	9	n.s.
% Fights	1	1	1	2	-	class<.03
% Social Act. Total	23	24	21	29	16	class<.003
Total # Non-Cont. Dist.	5.09	5.38	4.80	5.28		n.s.
Total # Cont. Dist.	2.58	2.41	2.75	1.89	3.28	class<.10
Total # Interruptions	3.74	3.53	3.95	3.31	4.16	n.s.
Total # Interactions	66.3	69.3	63.4	66.0	66.7	int.<.07
Interactions with Teacher	5.6	6.0	5.2	6.9	4.3	class<.08
% Activities with Girls	29	52	6	31	27	sex<.001
% Activities with Boys	30	5	54	29	30	sex<.001
% Activities with Boys & Girls	8	9	6	7	8	sex<.05
% Activities with T. Alone	5	6	4	6	4	class<.07
% Activities Alone	29	27	30	27	31	n.s.

[a] % Language Arts through unspecified schoolwork as child's only focus.
[b] % Language Arts through unspecified schoolwork accompanied by related talk.
[c] % Language Arts through unspecified school work accompanied by social talk.
[d] % Art through games as child's only focus,
[e] % Art through games accompanied by related talk.
[f] % Art through games accompanied by social talk.

TABLE 4

Regression Analyses for Selected Variables

Predicting Percent Activity Alone

	T-test	DF	Sig.	Mult. R
WISC Vocabulary	3.49**	27	.002	
MFF Time	1.79	27	.085	.640

F = 9.34, p<.001

Predicting Percent Reading Activities

	T-test	DF	Sig.	Mult. R
WISC Vocabulary	2.34*	27	.027	
MFF Time	2.06*	27	.049	.558

F = 6.12, p<.007

Predicting Percent Academic Activities

	T-test	DF	Sig.	Mult. R
WISC Vocabulary	2.91**	27	.008	
MFF Category	-1.40	27	.174	.635

F = 9.10, p<.001

Predicting Percent Focus on Activity Itself

	T-test	DF	Sig.	Mult. R
WISC Vocabulary	1.84	27	.077	
MFF Category	1.83	27	.079	.565

F = 6.34, p<.006

TABLE 4 cont.

Predicting Percent Language Arts

	T-test	DF	Sig.	Mult. R
MFF Errors	3.96***	27	.001	
WISC Vocabulary	3.49**	27	.002	.656

F = 10.18, p<.001

Predicting Range of Substantive Activities

	T-test	DF	Sig.	Mult. R
# Alt. Uses	2.58*	27	.016	
WISC Vocabulary	-2.27*	27	.032	.583

F = 6.96, p<.004

Predicting Rate of Interactions

	T-test	DF	Sig.	Mult. R
MFF Errors	1.78	27	.086	
WISC Vocabulary	-1.52	27	.141	.495

F = 4.83, p<.023

NOTES

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[2]I would like to express my appreciation to the Archdiocese of Chicago for allowing us to carry out the study in one of its schools and for their open and receptive attitude toward research.

[3]The label Non-Academic merely follows traditional usage. These activities obviously are important human endeavors and should be valuable for growth in children.

[4]A more detailed coding system is available on request.

[5]*<.05; **<.01, ***<.001

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